

REMARKS

Claims 1-21, 23-25 and 27-34 are pending. Claims 11-21, 23-25, and 27-32 are withdrawn from consideration. Claims 1 and 7 are amended. Claims 22 and 26 are canceled. Claims 33 and 34 are new.

Claim Amendments

Claim 1 is amended to more positively recite process steps, improve readability, and correct minor spelling errors. Claim 7 is amended to correct a typographical error.

New claim 33 depends from claim 1 and recites that heat treatment operations are carried out on-line, without any heat treatments being carried out separately. Claim 33 is supported by the specification at page 10, lines 6-11.

New claim 34 depends from claim 1 and recites that each step of the process is conducted at a lower temperature than the temperature of a previous step. Claim 34 is supported by the specification at page 10, lines 11-14.

No new matter has been added.

Claim Objections

Claims 22 and 26 stand objected to for improperly depending from withdrawn claims. Claims 22 and 26 have been canceled. Applicant therefore respectfully requests withdrawal of the objection.

Claim 7 stands objected to for reciting "... to cold from 1% to 9%... ." Applicant has amended the language in question to recite "... to cold reduction from 1% to 9%...," as suggested by the Examiner. Therefore, Applicant respectfully requests withdrawal of the objection.

Claim Rejections – 35 U.S.C. §103*Summary of the Invention*

The invention is directed to a production process that is as straightforward and reliable as possible, allowing products to be manufactured with a manufacturing cost that is as low as possible. (See paragraph [0017] of the application). The aforementioned objects are achieved, as explained in paragraph [0078] of the application, by conducting out on-line the three following heat treatment operations, which are usually carried out separately in prior art processes: solution treatment (conducted according to the invention during the initial hot-rolling step), quenching (conducted according to the invention when cooling the strip), aging treatment (conducted according to the invention when cooling the coil).

For the reasons provided below, Applicant respectfully submits that the cited prior art references do not teach or suggest the claimed process and product made from the process.

Cho

Claims 1-6, 8 and 22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Cho (US 4,988,394). Applicant respectfully requests reconsideration and withdrawal of the rejection.

Claim 22 is canceled. The rejection of claim 22 is therefore moot.

The Examiner asserts that Cho discloses an overlapping composition, and that it would have been obvious to select the claimed composition through routine experimentation. The Examiner asserts that Cho teaches homogenization at a temperature range overlapping the claimed homogenization temperature range. The Examiner also asserts that Cho teaches hot rolling at about 800°F, which is within the claimed first hot rolling temperature range from T_3 (output) to T_2 (input). The Examiner asserts that because Cho does not specify heating during hot rolling, it would be obvious to obtain the relationship $T_3 < T_2$. The Examiner further asserts that Cho teaches warm rolling at a temperature between 350°F and 500°F, which overlaps the claimed second hot rolling input temperature range T_5 . With regard to the claimed temperature T_4 upon cooling after the initial hot rolling step, the Examiner asserts that

Cho teaches that the warm rolling temperature should not exceed the precipitation heat treatment temperature (up to 550°F, which is within the temperature range T₄). The Examiner also asserts that Cho teaches cold working and rolling at a temperature from 200°F to 550°F, which overlaps the claimed coiling temperature T₆.

The process disclosed in Cho differs from the claimed process in several ways. A chart comparing the process of claim 1 to the process disclosed in Cho is provided below to more clearly illustrate the differences between the claimed process and the Cho process.

Step	Present Claims	Cho, Column 2,3&4	Cho Example, Column 5
A	1. A process for generating an intermediate laminated product in an aluminum alloy of the Al-Zn-Mg type, said process comprising: a) generating a plate by semi-continuous casting, the plate containing (in percentages per unit mass):	the alloy as described herein can be provided as an ingot or billet for fabrication into a suitable wrought product by casting techniques currently employed in the art for cast products, with continuous casting being preferred.	ingot suitable for rolling
B	Mg 0.5-2.0 Mn<1.0 Zn 3.0-9.0	these aluminum based alloys contain 1.0 to 12.0 wt. % Zn, 0.5 to 4.0 wt. % Mg, max. 1.0 wt. % Mn,	Zn = 10, Mg = 1.8
C	Si<0.50 Fe<0.50 Cu<0.50 Ti<0.15 Zr<0.20 Cr<0.50	max. 3.0 wt. % Cu, max. 0.5 wt. % each of Si, Fe, Cr, Ti, Zr, Sc and Hf,	Cu = 1.5 Zr = 0.12
D	remainder aluminium with inevitable impurities,	the balance aluminum, incidental elements and impurities	
E	in which Zn/Mg>1.7;	-	-
F	b) subjecting said plate to homogenization or reheating to a temperature T ₁ , selected so that 500°C ≤ T ₁ ≤ (T _s – 20°C), where T _s is the alloy burning temperature,	Homogenization in the range 850 °F to 1050 °F (454 °C to 566 °C)	Homogenized
G	c) conducting an initial hot-rolling step including one or more roll runs on a hot rolling mill, an input temperature T ₂ of the initial hot rolling step being selected such that (T ₁ – 60°C) 5 ≤ T ₂ ≤ (T _i – 5°C), and the rolling process being conducted in such a way that the output temperature T ₃ is such that (T ₁ – 150°C) ≤ T ₃ ≤ (T _i – 30°C) and T ₃ ≤ T ₂ ;	Hot rolling to a slab dimension	Hot rolled at about 800 °F (426 °C)
H	d) cooling a strip emerging from said initial hot-rolling step to a temperature	-	-

	T_4 :		
I	-	Reheating in the range 500° F to 900° F (260 to 482 °C), preferably 700 °F to 800 °F (371 to 426 °C)	Annealed 30 minutes at 750 °F (399 °C)
J	-	Cooled at a rate sufficient to retain dissolved elements in solution (preferably cold water quench or rapidly cooled)	cold water quench
K	-	Elevated temperature precipitation heat treatment, 200 °F to 550 °F (93 to 288 °C)	precipitation heat treated 12 hours at 400 °F (204 °C)
L	e) conducting a second hot-rolling step on said strip-at an input temperature T_5 , the input temperature T_5 being selected such that $T_5 \leq T_4$ and $200^\circ\text{C} \leq T_5 \leq 300^\circ\text{C}$, and the second hot-rolling process being conducted in such a way that the coiling temperature T_6 is such that $(T_5 - 150^\circ\text{C}) \leq T_6 \leq (T_5 - 20^\circ\text{C})$.	working or rolling to thin gauge plate or sheet stock. Preferably warm rolling 200 °F to 550 °F (93 to 288 °C)	rolled at about 400 °F (204 °C)
M	-	solution heat treatment at a temperature in the range 800° to 1050 °F (427 to 566 °C)	solution heat treated at 880 °C (471 °C)
N	-	rapid quenching, preferably with a quenching rate of at least 100 °F/s (38 °C/s).	cold water quench
O	7. said intermediate laminated product is subjected to cold working reduction from 1% to 9%, and/or to an additional heat treatment including one or more points at temperatures from 80° C. to 250° C., said additional heat treatment being able to occur before, after or during said cold working.	aging, preferably at a temperature in the range 150 °F to 400 °F (65 - 204 °C)	-

As shown above, several steps taught by Cho are not present in the instant claimed process, namely claims I, J, K, M and N. Specifically, the first (steps I, J) and second (steps M, N) solution heat treatment operations taught by Cho are absent from the instant claims. Cho does not teach a simplified process which would reduce cost in the same manner as the instant invention. To the contrary, Cho teaches a process with additional steps compared to the usual process, which will increase cost.

Moreover, Cho does not teach or suggest a process wherein the temperature decreases throughout the process as in the claimed invention. A comparison between Figure 1 of the instant application and the process of Cho clearly shows the difference in the temperature profiles of the two processes. In particular, the reheating step I (above) of Cho is conducted at a temperature which is likely to be higher than the exit temperature of the hot rolling step G (above). Regarding step G, the examiner has stated that "because US'394 does not specify heating during the hot rolling, it would be obvious to obtain the relationship $T_3 < T_2$." This statement is generally true even though one skilled in the art would know that even when no heating step is conducted, temperature may rise during heat rolling because metal deformation generates heat. It is likely that the output temperature of step G is significantly lower than the initial hot rolling temperature of step G, making it lower than the temperature of reheating of step I. Furthermore, the claimed process differs from the Cho disclosure in that the solution heat treatment and quenching steps M and N of Cho are each conducted at a temperature that is significantly higher than that of the warm rolling step L. Thus, the Cho process again exhibits an increase in temperature from one step to the next, whereas the process of the present application exhibits a decrease in temperature from one step to the next.

For at least the above reasons, Claim 1 is allowable over Cho. Claims 2-6 and 8 depend from claim 1, and are therefore also allowable.

Cho and Mohr et al.

Claims 7, 8 and 10 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Cho in view of Mohr et al. (WO 92-03586). Applicant respectfully requests reconsideration and withdrawal of the rejection.

Claims 7, 8 and 10 depend from claim 1. Claim 1 is allowable over Cho for the reasons provided above. Like the Cho disclosure, the Mohr disclosure also teaches a process with a separate solution heat treatment step and a temperature rise within the process. Therefore, Mohr does not teach or suggest the subject matter of claim 1 that is missing from the Cho disclosure. For at least this reason claims 7, 8 and 10 are allowable over Cho and Mohr et al.

Cho, Mohr et al. and Saunders

Claim 9 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Cho in view of Mohr et al. and Saunders (NPL). Applicant respectfully requests reconsideration and withdrawal of the rejection.

Claim 9 depends from claim 1. Claim 1 is allowable over Cho and Mohr et al. for the reasons provided above. Saunders also does not teach or suggest the features of claim 1 that are absent in Cho and Mohr et al. For at least this reason, claim 9 is allowable.

Cho, Mohr et al. and Kinsman

Claim 26 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Cho in view of Mohr et al. Applicant respectfully requests reconsideration and withdrawal of the rejection.

Claim 26 is canceled. The rejection of claim 26 is therefore moot.

New Claims

New claims 33 and 34 depend from claim 1. These claims clarify that separate solution heat operations are excluded by the instantly claimed process, and that each step of the process is conducted at a temperature that is lower than the temperature of the previous step.

Claim 33 recites that heat treatment operations are carried out on-line, without any heat treatments being carried out separately. This is not the case for Cho, wherein reheating of the slab and cooling (steps I and J) are not carried out on line, but separately. The remainder of the cited references also do not teach or suggest this feature. Therefore, claim 33 is allowable.

Claim 34 recites that each step of the process is conducted at a lower temperature than the temperature of a previous step. This is clearly different from the process taught by Cho, wherein at least the second solution heat treatment (step M) is clearly at a higher temperature than the previous step. Additionally, none of the other cited references teach or suggest this feature. Therefore, claim 34 is allowable.

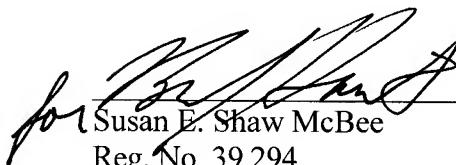
CONCLUSION

In view of the foregoing remarks, Applicant respectfully asserts that the rejections as set forth in the Office Action of April 24, 2008 have been addressed and overcome. Applicant further respectfully asserts that all claims are in condition for allowance and requests that a Notice of Allowance be issued. If issues may be resolved through Examiner's Amendment, or clarified in any manner, a call to the undersigned attorney at (404) 879-2443 is courteously solicited.

The Commissioner is hereby authorized to charge any required fees or credit any overpayment to Deposit Account No. 09-0528.

Respectfully submitted,

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